label, chromophoric label, (bio) luminescent label or label containing haptens, biotin, metal complexes, metals or colloidal gold.

6. (Amended) Fusion proteins of polypeptides according to claim 1, characterized in that an enzyme, another protein or a protein domain, a signal sequence and/or an affinity peptide is fused to the amino terminus of the polypeptide in an operable manner.

7. (Amended) Fusion proteins of polypeptides according to claim 1, characterized in that an enzyme, another protein or a protein domain, a targeting sequence and/or an affinity peptide is fused to the carboxy terminus of the polypeptide in an operable manner.

8. (Amended) A nucleic acid, characterized in that it comprises a sequence coding for a mutein or a fusion protein of a mutein of the bilin-binding protein according to claim 1.

13. (Amended) The method according to claim 10, wherein the enrichment of step (d) is carried out by forming a complex of the muteins with the digoxigenin group and subsequently dissociating the complex.

15. (Amended) A method for preparing a mutein or a fusion protein of a mutein of the bilin-binding protein according to claim 1 for preparing a mutein which is obtainable by:

(a) subjecting the bilin-binding protein to random mutagenesis at at least one of the sequence positions 28, 31, 34, 35, 36, 37, 58, 60, 69, 88, 90, 95, 97, 114, 116, 125, and 127,

(b) enriching resulting muteins with binding affinity for the digoxigenin group by selection and isolating said muteins,

(c) subjecting the muteins obtained in step (b) to another random mutagenesis at at least one of the sequence positions, 28, 31, 34, 35, 36, and 37, and

(d) again enriching the resulting muteins by selection and isolating said muteins,

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characterized in that the nucleic acid coding for the mutein or the fusion protein of a mutein of the bilin-binding protein is expressed in a bacterial or eukaryotic host cell and the polypeptide is obtained from the cell or the culture supernatant.

17. (Amended) A method for detecting the digoxigenin group, wherein a mutein of the bilin-binding protein or a fusion protein of a mutein of the bilin-binding protein according to claim 1 or a mutein which is obtainable according to a method which is obtainable by:

(a) subjecting the bilin-binding protein to random mutagenesis at at least one of the sequence positions 28, 31, 34, 35, 36, 37, 58, 60, 69, 88, 90, 95, 97, 114, 116, 125, and 127,

(b) enriching resulting muteins with binding affinity for the digoxigenin group by selection and isolating said muteins,

(c) subjecting the muteins obtained in step (b) to another random mutagenesis at at least one of the sequence positions, 28, 31, 34, 35, 36, and 37, and

(d) again enriching the resulting muteins by selection and isolating said muteins,

which is brought into contact with digoxigenin or with conjugates of digoxigenin under conditions suitable for effecting binding of the mutein to the digoxigenin group, and the mutein or the fusion protein of the mutein is determined.